

# OWNER'S MANUAL

PLEASE READ BEFORE OPERATING THIS EQUIPMENT.

## STA-7M am/fm mobile stereo receiver

CATALOG NO. 31-1978



CUSTOM MANUFACTURED FOR RADIO SHACK



A DIVISION OF TANDY CORPORATION

**REALISTIC**®



For your own protection, we urge you to record the Serial Number of this unit in the space provided. You'll find the Serial Number on the back panel of the unit.

Serial Number

### RADIO SHACK LIMITED WARRANTY

This equipment is warranted against defects for 2 years from date of purchase. Within this period, we will repair it without charge for parts and labor. Simply **bring your sales slip** as proof of purchase date to any Radio Shack store. Warranty does not cover transportation costs. Nor does it cover equipment subjected to misuse or accidental damage.

This Warranty gives you specific legal rights and you may also have other rights which vary from state to state.

*We Service What We Sell*

REALISTIC AUDIO PRODUCTS are the proud result of Radio Shack engineering, research, development, and over 50 years of experience in electronics. Laboratories are maintained in Boston, Ft. Worth, Los Angeles, and abroad. In every sense a national brand, the Realistic label is worn with equal distinction by our highly original Communications and Citizens Band (two-way radio) products, and numerous other items including: tape, headphones, antennas, intercoms and tubes.

# REALISTIC®

THE BRAND WITH OVER 10,000,000 CUSTOMERS

*In choosing this fine Realistic product you have demonstrated a rather acute awareness of the good old American custom called "getting the most for your money". With Realistic this is not an idle boast.*

*The "Line" was born in Boston, long famous for Yankee ingenuity — and thrift. Its original intent was to bridge a gap between \$100 equipment and \$25 equipment where, at the time, there was a real void in hi-fi merchandise.*

*Early products were a \$39.95 FM tuner, a \$29.95 preamp/amplifier, a \$19.95 speaker. Soon we found ourselves a unique niche as manufacturing retailers.*

*Capacity and ability grew simultaneously. Soon Realistic hi-fi products — loudspeakers, receivers, tape decks, even table radios — began receiving critical acclaim for faultless performance as well as value. Dealers and franchises from all over the world began requesting a Realistic franchise.*

*Today you can shop The Worldwide Supermarket of Sound® with the confidence that you're getting the widest selection of quality hi-fi equipment available anywhere — whether you're looking at budget-priced extension speakers or true audio-ophile receivers.*



# SPECIFICATIONS

## PRE-AMPLIFIER & AMPLIFIER

Audio Output Power at no more than 1% Total Harmonic Distortion into 4 ohms, over the audio spectrum, 20 to 20,000 Hz. : 10 watts RMS (minimum RMS power, both channels driven).

Frequency Response (AUX input at 1 watt) : 15–30,000 Hz ( $\pm 2$  dB)

Sensitivity (for full output) PHONO MAG : 2.7 mV

AUX : 160 mV

TAPE IN : 1 V

Tape Out level PHONO MAG 2.7 mV Input : 85 mV

AUX 160 mV Input : 90 mV

Signal-to-Noise Ratio PHONO MAG (IHF "A" Weight) : 75 dB

AUX (IHF "A" Weight) : 90 dB

Phono MAG Overload : 80 dB

Tone Control Action BASS :  $\pm 10$  dB @ 100 Hz

TREBLE :  $\pm 10$  dB @ 10,000 Hz

Presence (1.5 kHz) : +6 dB

## FM TUNER

Sensitivity (IHF) : 2.8  $\mu$ V (14.2 dBf)

Limiting Sensitivity ( $-3$  dB) : 3.2  $\mu$ V

Signal-to-Noise Ratio (1 mV) : 60 dB

Total Harmonic Distortion MONO : 0.5%

STEREO : 0.6%

Stereo Separation (1 kHz) : 34 dB

Image Rejection : 50 dB

IF Rejection : 80 dB

ACA (Selectivity) : 45 dB

Capture Ratio : 3 dB

## AM TUNER

Sensitivity (with Dummy) : 30  $\mu$ V for 20 dB S/N

Image Rejection : 60 dB

IF Rejection : 45 dB

Total Harmonic Distortion : 1.5% (5 mV)

AGC Figure of Merit : 50 dB

ACA (S/N 20 dB) : 40 dB

**Power Requirements:** 13.8 V DC, Negative Ground

**Accessories:** 12 Foot Speaker Cable with Connector (Left and Right)  
Heavy Duty Multi-Position Mounting Bracket with All Hardware  
Quick Connect Cable Assembly for adding Cassette or 8-Track Player

You don't have to leave great stereo sound at home when you hit the road with your new REALISTIC STA-7M Mobile Stereo Receiver! The STA-7M is a mobile version of our acclaimed STA-7, designed to electronically and decoratively match our famous MINIMUS-7 speaker system. Your STA-7M is loaded with great features like these:

- 10 Watts of clean "honest" power will drive almost any speaker system -- even two sets of speakers!
- FM front-end used an FET (Field-Effect Transistor) for high sensitivity and low noise.
- FM IF employs a quadrature IC which assures minimum noise and low distortion, combined with high sensitivity.
- PLL-Multiplex IC for wide and stable stereo separation.
- The AM section uses an AM tuner IC plus a three-gang variable inductor for superior reception of both strong and weak signals.
- Phono-Preamplifier uses operational amplifier IC (OP-AMP IC) for high gain, low distortion and wide dynamic range.
- Main Amplifier uses BTL (Balanced Transformerless) Amp IC which assures high-gain and low distortion.
- Power Output Stages include two overload protection circuits. These circuits provide complete protection from overdriving, thermal and speaker problems (shorting or otherwise).

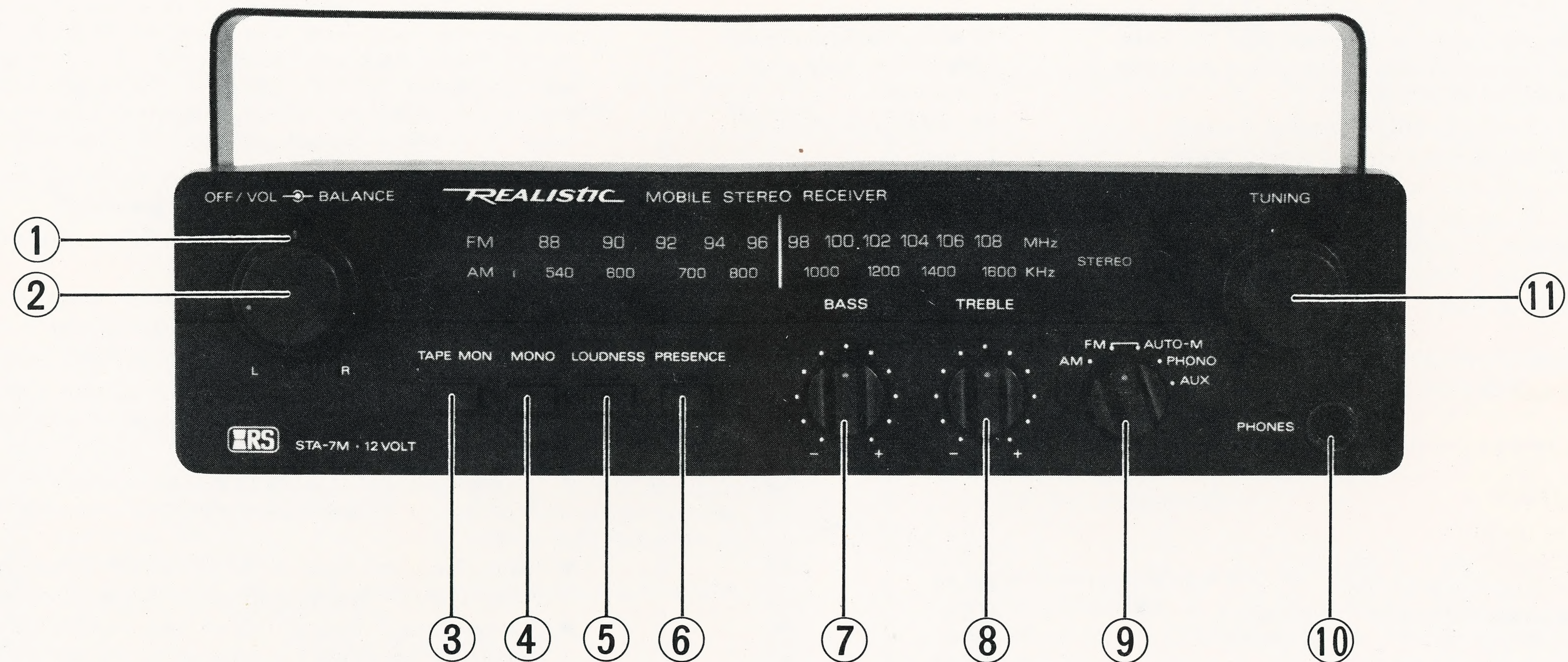
In addition, your new STA-7M has a PHONES jack, an AUX input jack, TAPE MONitor and other features for your "dream" car, boat or recreational vehicle stereo system!

**NOTE:** Before connecting the STA-7M, please read the following instructions.

They will insure your getting the most enjoyment from your new Receiver.

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## CONTROLS AND FUNCTIONS

### ① BALANCE

Adjusts balance of sound between left and right channels. At the center position (you'll feel a slight "catch" there) sound will be equal from both channels.

### ② OFF/VOL

Turn clockwise to power "ON". Adjusts volume of sound from both channels to the desired level.

### ③ TAPE MONitor

Push in to play tapes or to monitor a tape as it is being recorded.

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#### ④ MONO

When pressed in, switches the amplifier and tuner from stereo to monaural operation. In the "out" position, the amplifier operates in stereo and the FM tuner automatically switches to stereo when there is a stereo signal.

#### ⑤ LOUDNESS

With the button in, boosts low and high frequencies to compensate for the ear's reduced sensitivity to these frequencies at low volume levels. With button out, the compensation is removed.

#### ⑥ PRESENCE

When pressed in, the gain of middle frequency (1.5 kHz) is boosted.

#### ⑦ BASS

Controls low frequencies. At the center position, it does not affect the sound. Turn towards + to boost bass response; towards — to de-emphasize the low frequencies. Once the best-sounding position of this control is found, it need not be readjusted.

#### ⑧ TREBLE

Controls high frequencies. At the center position, it does not affect the sound. Turn towards + to boost treble response; towards — to de-emphasize the high frequencies.

#### ⑨ SELECTOR

Chooses one of five input functions.

AM — Activates the built-in AM tuner.

FM — Activates the built-in FM tuner.

AUTO-M — Activates the built-in FM tuner and special Auto-Magic circuitry for simplified FM tuning.

PHONO — For any turntable equipped with a magnetic cartridge.

AUX — For any high-output source — a crystal or ceramic phono cartridge, a second tape deck, TV, Ham radio, etc.

#### ⑩ PHONES

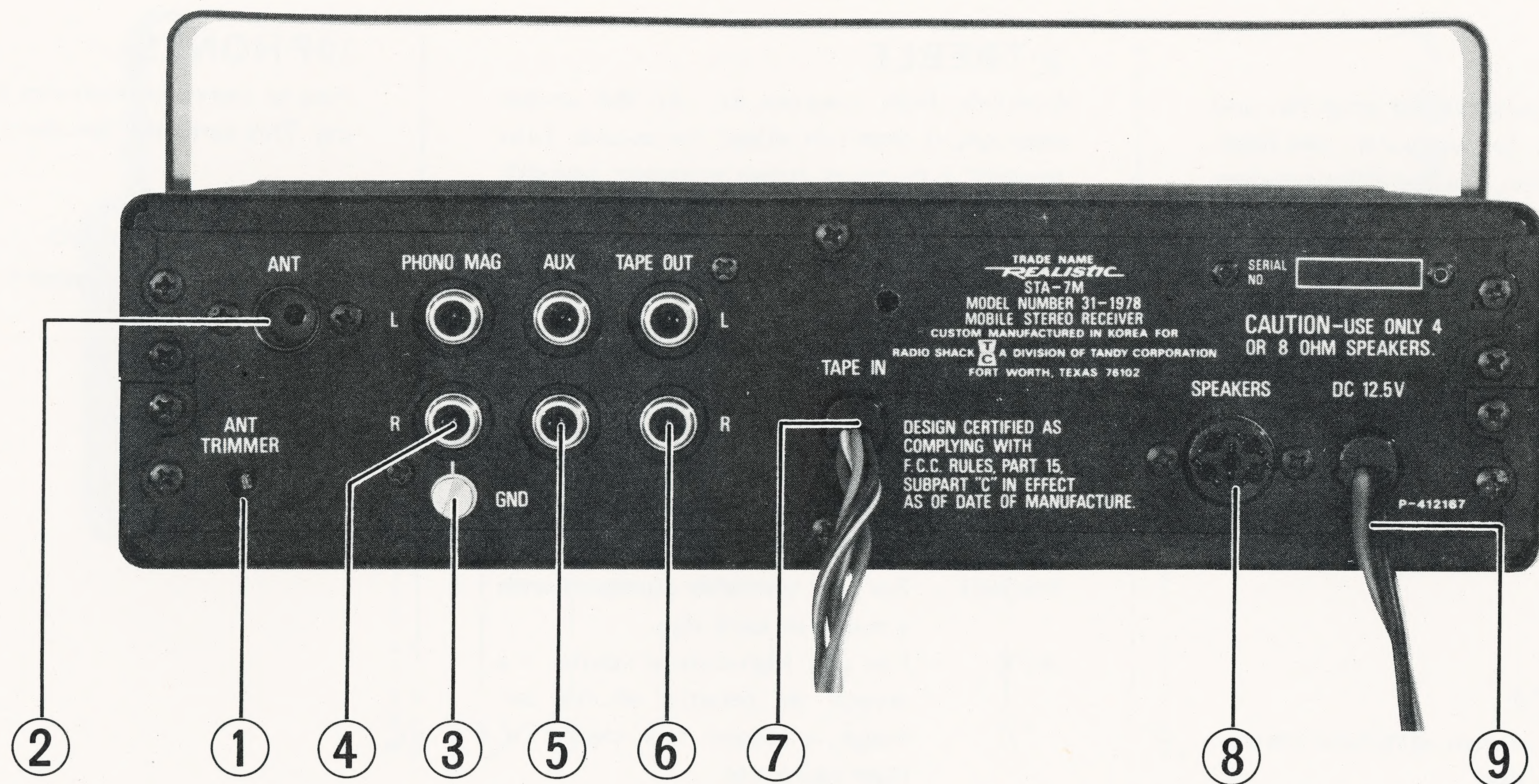
Plug in stereo headphones for private listening. This turns the Speakers off.

#### ⑪ Tuning Knob

Tunes AM and FM stations.

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## REAR PANEL

### ① AM ANTenna TRIMMER

Lets you tune the Antenna for best reception on AM (see **Antenna Trimmer Adjustment**, page 10).

### ② ANTenna Jack

Connect Antenna plug here.

### ③ PHONO MAG GND Screw

Accepts the green or black ground wire found on most turntables. Making this "ground" connection reduces or eliminates hum.

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#### ④ PHONO MAG

Accepts output from any turntable equipped with a magnetic cartridge. These jacks are active when Selector is set to PHONO.

#### ⑤ AUX

Accepts output from any high-level source — a second tape player or TV audio, a ceramic or crystal phono cartridge, etc. These jacks are active when Selector is set to AUX.

#### ⑥ TAPE OUT

Permits tape recording any source chosen by the Selector. The output from these jacks is unaffected by the front panel controls.

#### ⑦ TAPE IN Connector Plug

Connect to Tape Player's Output jacks for tape playback — 5P plug contains Left and Right Tape In wires and "hot" power lead (with in-line fuse holder).

#### ⑧ SPEAKERS Jack

Connect the Speakers cable (provided) to this jack.

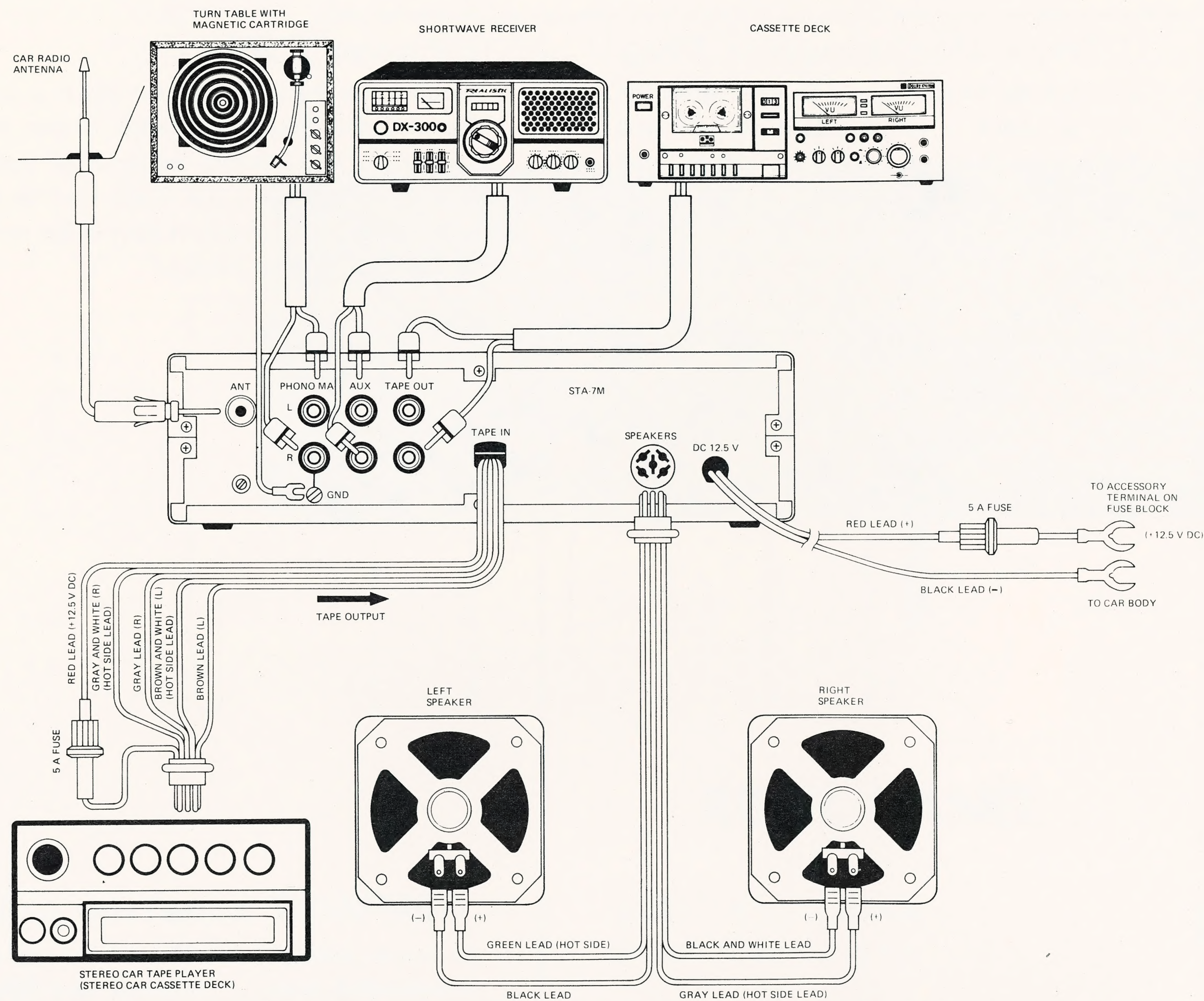
#### ⑨ Power Cable

Supplies the Receiver's power (12.5 V DC). Connect the Red lead (with in-line fuse holder) to the positive terminal of power source, and connect the Black lead to the negative terminal of power source (or metal part of the Vehicle's body).

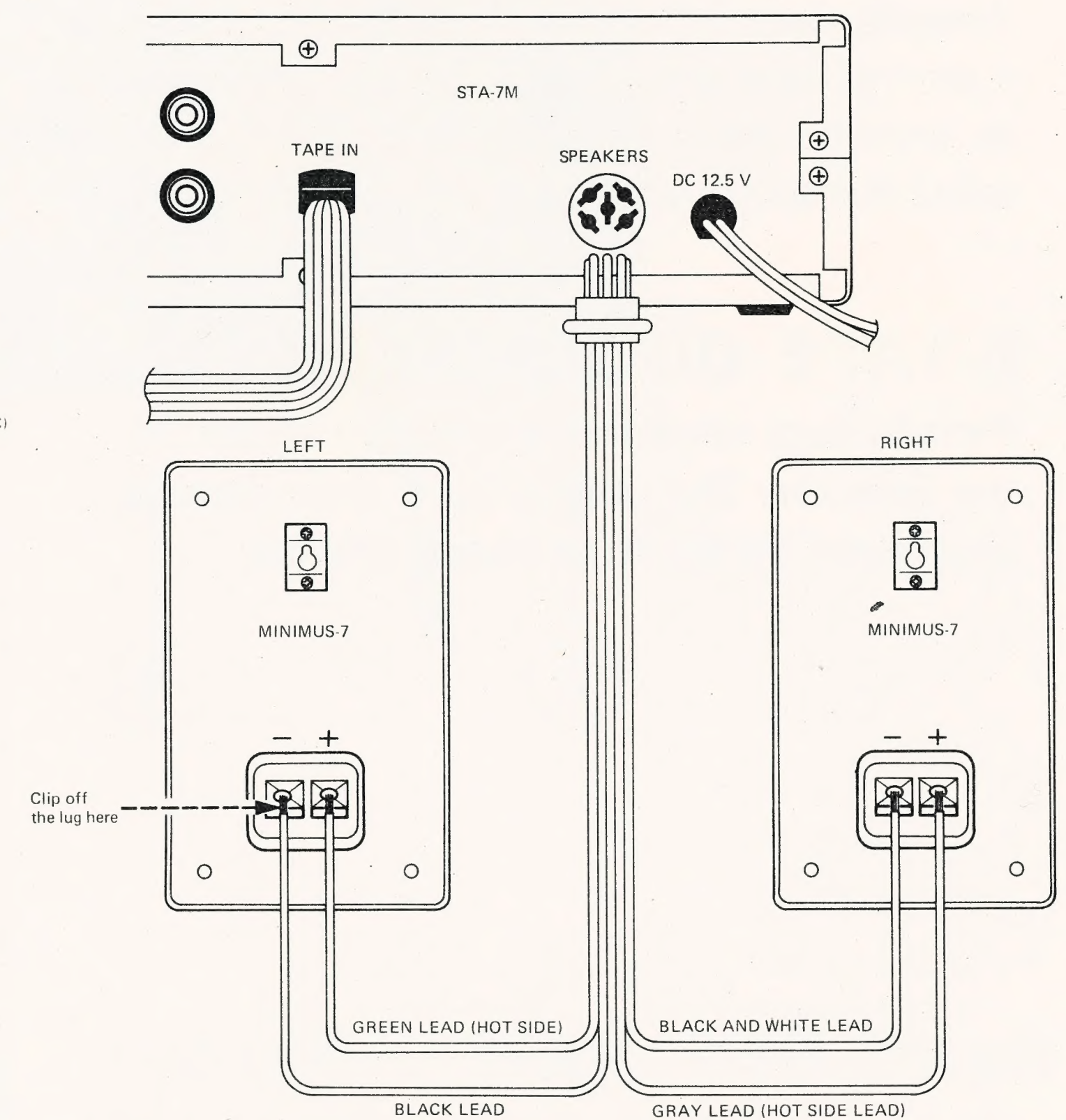
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# CONNECTIONS



For connection of Minimus-7 Speaker, clip off the lugs from speaker cable. Carefully remove about ¼" (6.5 mm) of insulation and connect to Minimus-7 speaker terminals. Be sure to connect + and - leads to proper terminals.



## IMPORTANT NOTE

Although the installation is relatively simple, it does require some electrical and mechanical ability. Incorrect installation could damage both your Receiver and your car's

electrical system. If you have any doubts about your ability to correctly install this unit, have the installation performed by a qualified service technician.

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We recommend that you make all electrical connections (See illustration on page 10) before installing the Unit.

**NOTE:** This unit is designed for 12 volt DC, Negative ground. If your vehicle does not provide 12 volts negative ground, you need a voltage inverter, such as Radio Shack's 22-129.

Be sure the speakers you select can handle the high power output of your Receiver (as much as 20 watts into 4 ohm load).

To enjoy the full benefit of this extra power, use a pair of larger Realistic Car Speakers (12-1845/8/9/50). For the very best in mobile stereo sound, use a pair of MINI-MUS-7 speakers along with Brackets (40-2031).

We do not recommend the use of smaller speakers with this high-power Receiver.

## Power Cable Connection

1. Connect the Red lead (with in-line fuse holder) from the right side of rear panel to an Accessory terminal on your vehicle's fuse block (12.5 V DC).
2. Connect the Black lead from rear of the unit to one of the vehicle's frame screws.

## Speakers

1. Connect the Gray lead to the hot terminal of the Right Speaker.

2. Connect the Green lead to the hot terminal of the Left Speaker.

**NOTE:** Normally the hot terminal of the speaker has a "+" or Red mark.

3. Connect the Black lead to the other terminal of the Left Speaker.
4. Connect the Black and White striped lead to the other terminal of Right Speaker.
5. Plug the Speaker connector into the SPEAKERS socket on the rear of unit.

**Caution:** Be sure you do not connect the Black and Black-and-White Speaker leads to a common point — don't connect them to each other and don't connect them to the vehicle's frame.

These leads must not share the same connection (ground) point: connecting them together may damage the unit or cause severe distortion.

## Turntable

Connect the turntable leads to the PHONO inputs. If the turntable has a ground wire (usually green or black), connect it to the **PHONO GND** screw.

(NOTE: If the turntable has a ceramic or crystal cartridge, connect it to the AUX jacks.)

## Tape Player

For playback, disconnect existing 5-pin connector from the tape player and connect the Receiver's TAPE IN 5-pin connector to the car Tape Player's 5-pin socket.

If your existing car Tape Player uses a different type connector than Radio Shack's standard, consult a qualified electronics technician to do the work for you. (He may find our 270-017 to be helpful.)

The power to the Car Tape Player is switched on and off by the front panel OFF/VOL switch.

**NOTE:** A 5 A fuse comes supplied in the fuse holder of the red power lead. Change to an appropriate value fuse if your existing Tape Player uses other than 5 A fuse.

For recording, connect the Receiver's TAPE OUT jacks to the Recorder's Aux or Line input.

## Antenna

If you have an antenna lead in your car, plug the antenna lead into the ANTENNA jack. If you don't have an antenna, or you need a replacement antenna, check your Radio Shack store. You'll find replacements as well as dual-function antennas (for CB/AM-FM Radios, Monitor Radio, etc.).

## Auxiliary

Plug the output from any high level source into the **AUX** jacks. This input is ideal for a second tuner, TV audio, ceramic or crystal phono cartridges, a tape player, radio, etc.

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# INSTALLATION

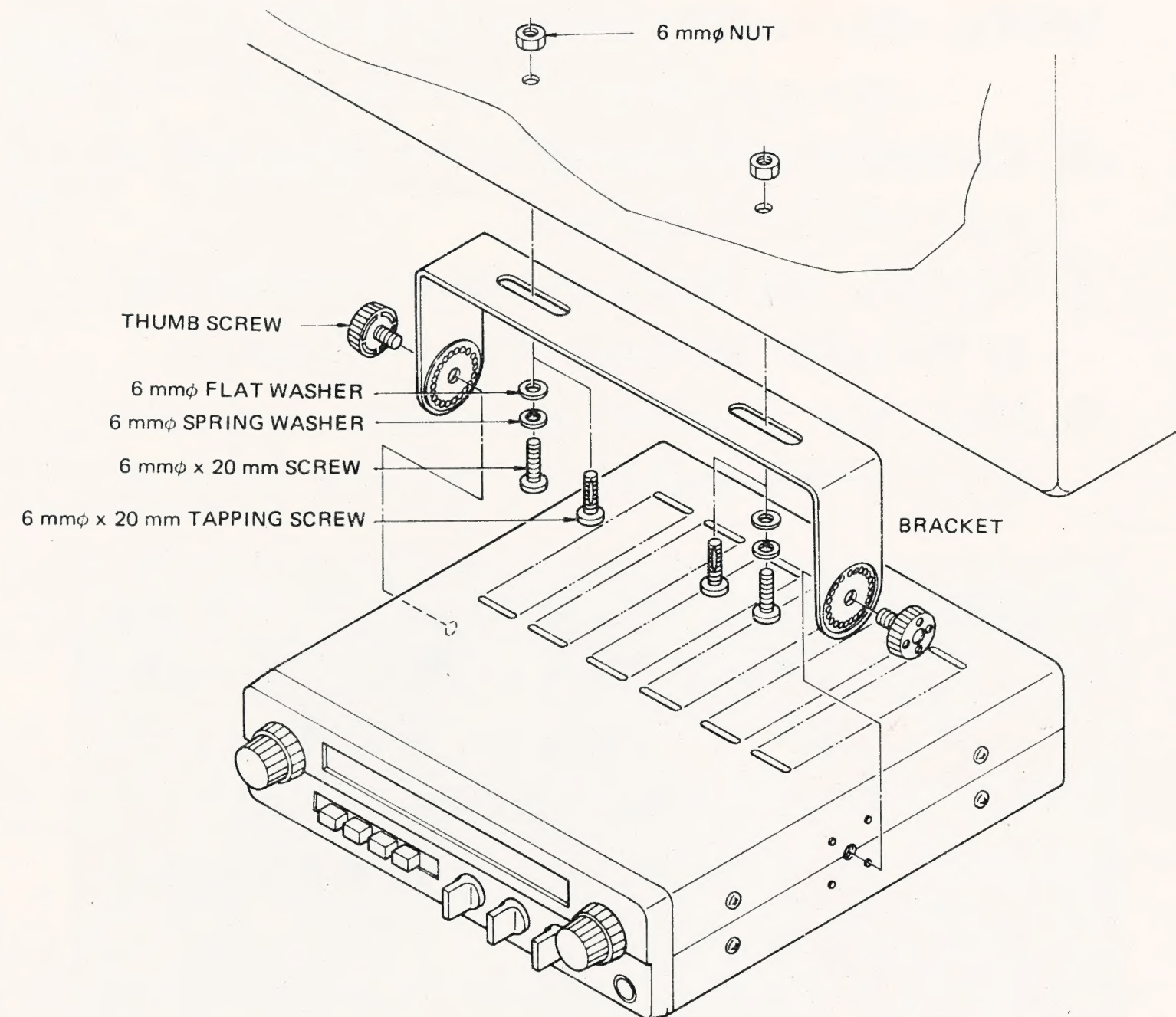
Safety and convenience are the primary considerations for mounting any piece of mobile equipment. All controls must be readily available to the operator without interfering with the movements necessary for safe operation of the vehicle.

Be sure all cables are clear of the brake, clutch and accelerator. Also, thought must be given to the convenience and comfort of passengers (for example, will they have adequate leg room?).

Another extremely important requirement is the ease of installation and removal (for service and maintenance). Mount your STA-7M so it can be slipped in and out very easily.

The most common mounting position for a Receiver is under the dash-board directly over the driveshaft hump. Do not mount your STA-7M in the path of the heater or air conditioning air stream.

When you have determined the best location for mounting, use the Mounting Bracket as a template to mark mounting holes. Take care when you drill holes that you do not drill into wiring, trim or other accessories. Mount the Bracket in position with bolts, lock washers and nuts or self-threading screws. Attach your STA-7M to the Bracket with the thumb screws.



## Antenna Trimmer Adjustment

After installation it is important to adjust the antenna trimmer screw for best AM reception. This adjustment is required only once and should be made with the antenna fully extended. Tune in a weak station between 1200 kHz and 1400 kHz. The antenna trimmer screw is on the left side of the unit. Use a screwdriver to carefully adjust it for the loudest and clearest signal.

## HOME INSTALLATION

While your STA-7M is designed for Mobile operation, you might wish to use it in your home, in conjunction with a 120 volt AC/12 volt DC Power Supply (available from your local Radio Shack). Here are a few tips in case you use STA-7M in your home . . .

1. For Tape Deck connection, use AUX jack for input. The 5-pin Tape Input connector can't be connected to an ordinary Tape Deck.

Also note that you can connect your Car Tape Player to a 5-pin connector (the 12-volt DC power is supplied through STA-7M).

2. The Speakers can be connected in the same way as for mobile installation. Be sure the connection does not provide common ground to the Speakers.
3. Your STA-7M has an antenna input jack designed to accept Motorola-type plugs. You can use antenna inputs ending in coaxial (PL-259) plugs by using our 278-208 Coax Adapter Plug. If you install an antenna system just for your STA-7M, you can use an ordinary Motorola-type plug like our 274-711 for antenna input. Or you can adapt one of our Car Antennas (12-1302, 12-1306, etc.) for home use by constructing your own stand or support for one.

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# OPERATING THE STA-7M

## Before Turning on your STA-7M

1. Double-check all connections -- especially the speaker connections -- to assure that all connections are firm and that there are no shorts.
2. All push buttons should be out.

Now, turn the Power/Volume control(s) to ON.

## HEADPHONES

The PHONES jack permits headphone Stereo listening. When headphones are connected to the PHONES jack, the Speakers do not operate.

## OFF/VOLUME and BALANCE

Rotate the outer (away from panel) portion of OFF/VOLUME control clockwise to turn power on. Adjust for appropriate listening level.

If necessary, rotate inner ring (closer to panel) to achieve the correct Left-Right balance according to listening position, program materials, etc.

## BASS

Turn the BASS control toward + to boost the low frequencies or toward — to de-emphasize them. In the center position, the control has no effect on the sound.

## TREBLE

Turn the TREBLE control toward + to boost high frequencies or toward — to de-emphasize them. In the center position, the control has no effect on the sound.

## Selecting the Source

Choose the input you want by turning the Selector switch.

AM — Use the Tuning knob to find the desired station. Fine-tune for the loudest and clearest signal.

FM — Use the Tuning knob to select the desired station. If you're tuned to a stereo FM station, the STEREO indicator will light up. Adjust tuning for the loudest and clearest signal.

FM AUTO-Magic — Use the Tuning knob to find the desired station. There's no need to fine-tune the desired station — Auto-Magic does that for you. Auto-Magic tuning will automatically fine-tune the station with electronic precision and lock it in for drift-free listening.

PHONO — Adjust the Volume, BALANCE and Tone controls. For the best sound and longest record life, do not track your cartridge below the recommended force.

Light tracking may actually cause more distortion than heavy tracking.

AUX — Adjust VOLUME, BALANCE and Tone controls. The auxiliary input can be used for any high-level source such as a tape player, a second tuner, TV sound, ceramic or crystal phono cartridge, Ham radio, etc.

NOTE: If the TAPE MONitor button is pressed in, the Selector switch will have no effect on the sound.

## TAPE MONitor

Press the TAPE MONitor button on to play tapes or (with a three-head deck) to listen to tapes immediately after they have been recorded. If no tape is being played, pressing this button will silence the Receiver.

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## **MONO**

Press the MONO button to defeat normal stereo operation. The result is a composite signal (left + right). When you listen to weak FM stereo stations, pressing the MONO button will reduce the hiss, but the signal will no longer be stereo.

## **LOUDNESS**

When listening at low volume, press the LOUDNESS button. This overcomes the ear's reduced sensitivity to treble and bass at low volume by boosting these frequencies.

## **PRESENCE**

When you're listening to a vocalist, press the PRESENCE button to increase the midrange frequencies: this will appear to move the vocalist "up front".

## **Overload Protector**

Your Receiver has built-in, automatic overload protection. If an abnormal load is presented to the speaker terminals, this protective circuit will automatically limit the output current and protect your Receiver and Speakers.

In this case, output power will drop to a very low level. If this happens, turn power "OFF" and check all speaker connections; be sure no pieces of wire are touching between Speaker terminals and be sure you don't have speakers less than 4 ohms connected.

## **Thermal Protection**

Your Receiver also has built-in Thermal overload protection. This means it can not become abnormally hot and damage some portion of the circuitry. If internal temperatures do rise abnormally, the Receiver will automatically silence itself. If this happens, check to be sure you have not placed something over the ventilation holes — If you have, remove it. If you are using speakers with excessively low impedance, the amplifier circuit may be over-driven and thus producing excessive heat.

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# SERVICE AND MAINTENANCE

Your STA-7M has been built in accordance with Radio Shack's exacting quality control standards. However, it should be treated with reasonable care accorded any electronic equipment. Avoid exposing it to severe shock, dirt or moisture.

If you run into problems with the unit, we recommend you check the following:

1. Check all your cable connections. Make sure all the leads and plugs are secure at both ends.
2. Try interchanging cables and connections on the rear panel — sometimes this will give you a hint of where the problem lies — and may solve the problem for you.
3. If the dial scale lights are on — but you have no sound — make sure you don't have TAPE MON pressed in! If that is not the case — maybe the automatic thermal protection circuit has been activated. In such a case, turn off POWER and check your Speaker connections.
  - A. Make sure there is no short between the Speaker wires (stray strand of wire touching between terminals or to metal parts).

- B. If you use 4 ohm speakers, use only one pair. If you use two pairs, the speakers must be 8 ohm type (or greater).
  - C. In the case of Tape Playback mode and you have no sound, check the fuse in the 5-pin connector lead of TAPE IN.
  - D. Let the Receiver cool down for a few minutes and then turn Power back on.
4. If output from the Receiver drops to a low level and sound is slightly distorted, it may be the automatic current limit protection circuit is acting to protect the Receiver and/or Speakers. Turn off Power and check A and B under 3 above. When you are sure everything is OK, turn Power on again.

5. If the dial lights don't come on, the fuse may be blown. Check it: replace only with a 5 Amp fuse (in the red Power lead).

If any case, if none of the above does the job and you still have a problem — help is as close as your local Radio Shack store. Bring your unit in and be ready to describe the symptoms — we will get you back into good stereo sound ASAP!

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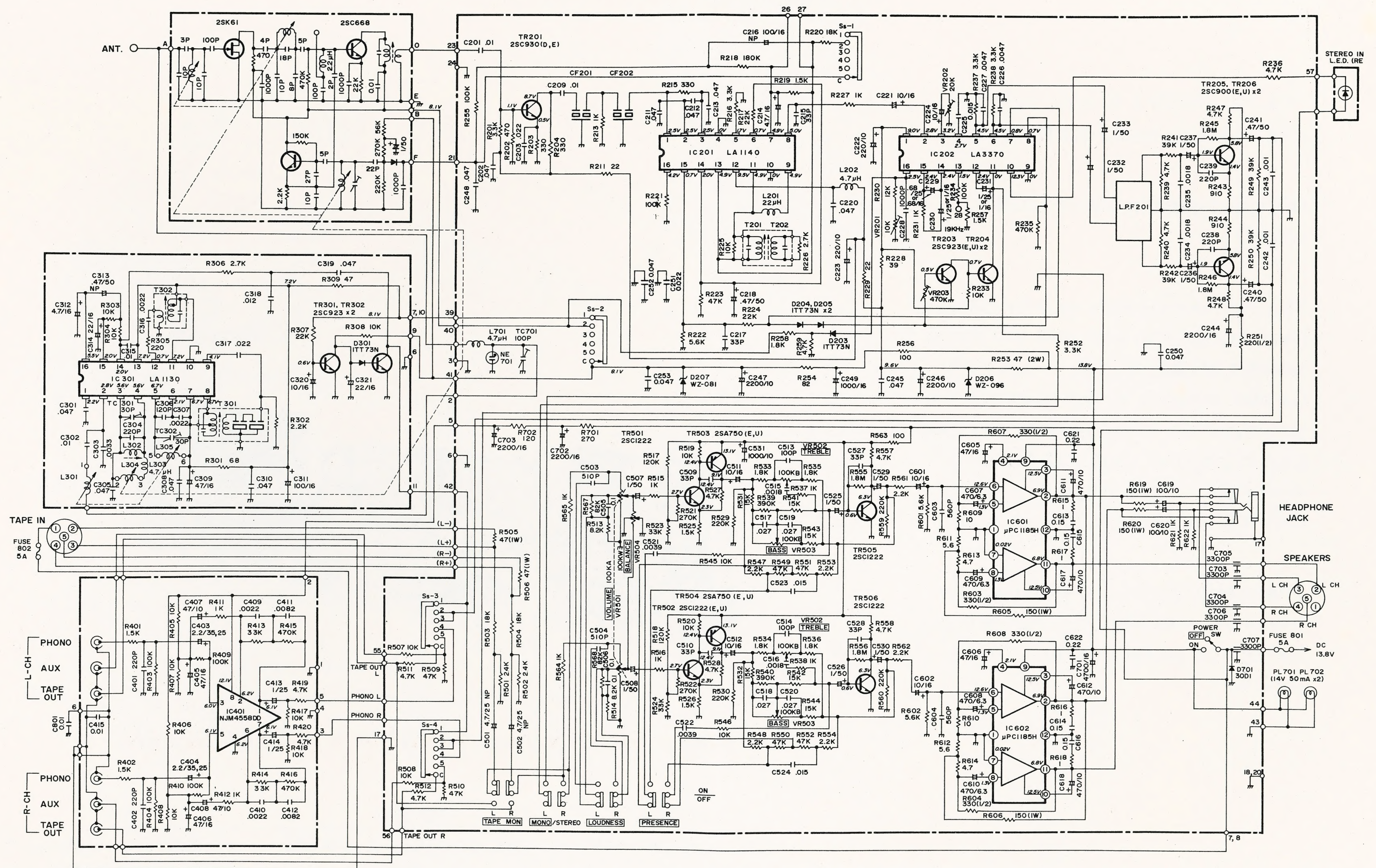


## NOTE

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# SCHEMATIC DIAGRAM



## NOTE:

- (1) ALL RESISTANCE VALUES ARE INDICATED IN "OHM" (K =  $10^3$  OHM).
- (2) ALL CAPACITANCE VALUES ARE INDICATED IN " $\mu$ F" (Pf =  $10^{-6}$   $\mu$ F).
- (3) Ss-1~Ss-4: SELECTOR SWITCH; 1 - AM, 2 - FM, 3 - FM AUTO, 4 - PHONO, 5 - AUX.

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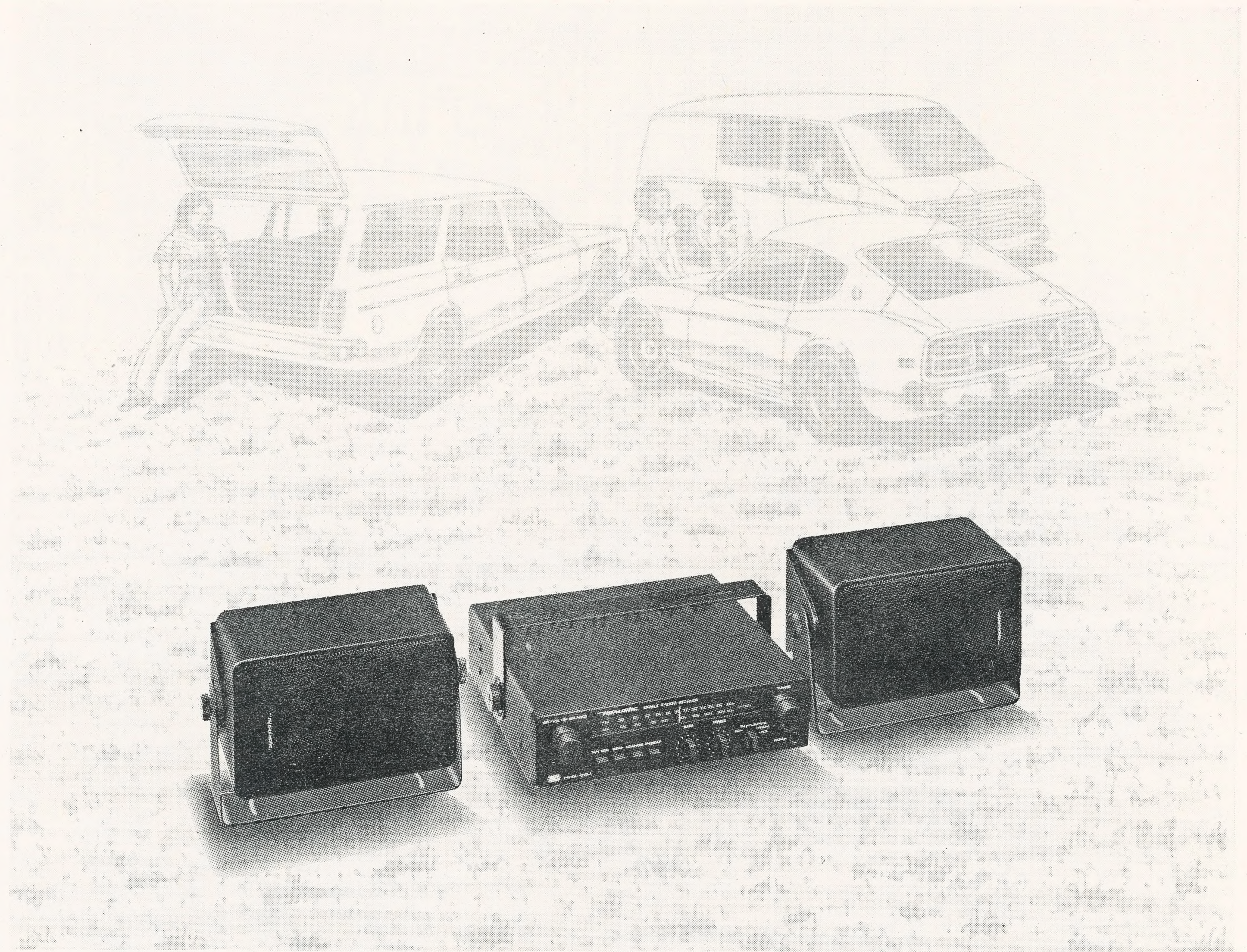
# The MINIMUS-7.....RADIO SHACK's Little Giant of a Speaker.....Goes Mobile

The MINIMUS-7 is little only in size — not in sound performance!

It's a real giant in concert-hall sound.

The high-compliance woofer element gives astounding bass and the dome tweeter produces crisp, clean highs. Careful acoustic design matches the two dynamic elements with the cast aluminum enclosure and damping materials . . . resulting in amazingly smooth, broad frequency response.

The widely-acclaimed MINI-7 now teams up with the STA-7M, bringing audiophile sound quality to your vehicle.



## *Radio Shack's new MOBILE SYSTEM SEVEN.*

### AUSTRALIA

280-316 VICTORIA ROAD  
RYDALMERE, N S W. 2116

### BELGIUM

PARC INDUSTRIEL DE NANINNE  
5140 NANINNE

### U. K.

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WEST MIDLANDS WS10 7JN

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